Published by :
https://www.ijert.org/
An International Peer-Reviewed Journal

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
Vol. 15 Issue 08 , August - 2026

Safety Culture and Its Impact on Cabin Crew Motivation and Performance in a Major Middle Eastern Airline

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Abstract **- This study examines the impact of safety culture on cabin crew motivation and performance in a major Middle Eastern airline. Safety culture was assessed through four dimensions: organizational commitment, operational personnel, formal safety systems, and informal safety systems. A quantitative survey design was used, and 206 valid responses from cabin crew were analyzed. Spearman correlation matrices were first used to examine multicollinearity among indicators. Confirmatory factor analysis was then applied to validate the measurement model, followed by structural equation modeling to test the relationships among the main constructs. The final structural model demonstrated acceptable fit, with a chi square to degrees of freedom ratio of 1.254, comparative fit index of 0.926, Tucker Lewis index of 0.922, and root mean square error of approximation of 0.035. The findings show that safety culture has a moderate relationship with cabin crew performance, while its relationship with motivation was very weak and not supported. Motivation showed a strong relationship with performance. These results suggest that safety culture contributes directly to performance but does not sufficiently stimulate motivation among cabin crew.**

Keywords **- Safety culture, cabin crew, motivation, performance, structural equation modeling, aviation safety**

I. INTRODUCTION

Safety culture is a central concern in aviation because operational failures can lead to severe consequences for passengers, crew, and organizations. The aviation industry has moved from a purely technical view of safety toward a broader organizational perspective in which shared values, reporting behavior, leadership commitment, and employee participation shape safety outcomes [1], [2]. This shift is especially important because modern aircraft and regulatory systems have become highly reliable, while human factors and organizational behavior remain major contributors to accidents and incidents [3].

Cabin crew are frontline aviation employees who operate in a complex environment that requires rapid decision making, compliance with safety procedures, coordination with flight deck personnel, and direct management of passengers during normal and abnormal operations. Although many safety culture studies focus on pilots, maintenance organizations, or general flight operations, cabin crew represent a distinct operational group whose safety perceptions may influence service delivery, safety behavior, motivation, and performance.

The present study investigates safety culture among cabin crew in a major Middle Eastern airline. It examines safety culture through four dimensions: organizational commitment, operational personnel, formal safety systems, and informal safety systems. The study also tests the relationships between safety culture, crew motivation, and crew performance. The main contribution is extending aviation safety culture assessment to cabin crew and evaluating whether safety culture is reflected only in performance outcomes or also in motivational outcomes.

II. LITERATURE REVIEW

Safety culture has been described as the shared values, beliefs, and practices that guide how safety is prioritized within an organization [1], [2]. In aviation, strong safety culture is associated with open reporting, continuous learning, management commitment, and proactive risk identification [4]. The literature shows that safety culture can be assessed using surveys, interviews, observations, and safety performance indicators. Survey based approaches are widely used because they allow researchers to collect standardized perceptions from large groups of employees [5].

Previous aviation studies have developed and validated safety culture instruments for commercial flight operations. Gibbons, Von Thaden, and Wiegmann developed a survey that assessed organizational commitment, management involvement, empowerment, reporting systems, and accountability in commercial aviation [6]. Their work is relevant because it demonstrates the importance of validating safety culture measures before drawing conclusions about organizational strengths and weaknesses. Other studies also show that safety culture perceptions may vary by operational context, nationality, and professional group, which supports the need to examine cabin crew separately rather than assuming that pilot results apply equally to cabin crew [7].

Motivation and performance are also important organizational outcomes. Employee motivation has been repeatedly linked to performance, especially when employees perceive support, clear communication, and meaningful work [8], [9]. In aviation, motivation may influence how employees comply

International Journal of Engineering Research & Technology (IJERT)
ISSN: 2278-0181
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with safety procedures, communicate risks, and perform under pressure. However, safety culture may not automatically translate into motivation if safety practices are experienced mainly as procedural control rather than participation and empowerment.

III. RESEARCH METHODOLOGY

A quantitative research design was used to assess safety culture and its relationships with cabin crew motivation and performance. The study population consisted of active cabin crew working for a major Middle Eastern airline. The survey was distributed electronically, and 206 complete responses were retained for analysis. The sample included cabin crew across operational ranks and was considered adequate for the structural equation modeling approach used in this study, as a sample size around 200 is commonly recommended for many SEM applications [10], [11].

The questionnaire was adapted from previously validated aviation safety culture instruments and modified to fit the cabin crew operational context. Safety culture was represented by four latent dimensions: organizational commitment, operational personnel, formal safety systems, and informal safety systems. Motivation and performance were measured as separate latent constructs. The survey used Likert type indicators, and the analysis was conducted using correlation matrices, confirmatory factor analysis, and structural equation modeling

Cronbach alpha was used to assess internal consistency. The safety culture scale showed good reliability, while motivation and performance showed excellent reliability. Spearman correlation matrices were used to check multicollinearity because the indicators were ordinal. A coefficient of 0.80 was used as a cutoff to identify potential multicollinearity concerns [12]. Confirmatory factor analysis was then performed for each construct before estimating the combined structural model. Model fit was evaluated using chi square to degrees of freedom, comparative fit index, Tucker Lewis index, incremental fit index, normed fit index, and root mean square error of approximation. Common guidelines consider comparative fit index and Tucker Lewis index values above 0.90 acceptable, and root mean square error of approximation values below 0.08 acceptable [13], [14].

V. MEASUREMENT MODEL RESULTS

Before estimating the structural relationships, each construct was examined separately using confirmatory factor analysis. The purpose was to verify that the observed indicators represented their respective latent variables and to remove indicators that showed weak measurement performance. This step was necessary because weak factor loadings can reduce measurement quality and distort structural relationships in the final model.

For organizational commitment, the initial model included safety values, safety fundamentals, and going beyond compliance indicators. GB2 was removed due to non-significance, and SF1 was removed due to weak standardized loading. The revised model demonstrated very good fit, with chi square to degrees of freedom of 1.127, comparative fit index of 0.989, Tucker Lewis index of 0.987, and root mean square error of approximation of 0.025.

For operational personnel, SUP2 and IP1 were removed due to weak measurement performance. The revised model showed good fit, with chi square to degrees of freedom of 1.453, comparative fit index of 0.970, Tucker Lewis index of 0.955, and root mean square error of approximation of 0.047. For the formal safety construct, RS4 and SP5 were removed due to relatively low standardized loadings. The revised model retained eleven indicators and demonstrated good fit, with chi square to degrees of freedom of 1.344, comparative fit index of 0.975, Tucker Lewis index of 0.968, and root mean square error of approximation of 0.041.

For informal safety, AC2, AC3, CA3, and PR3 were removed due to low factor loadings. The revised model showed excellent fit. For motivation, MT3 was removed at the construct level, and the retained indicators showed acceptable convergent validity. For performance, PR1 was removed due to a very low standardized loading, while PR2 to PR5 were retained. Although the performance model showed moderate fit in some indices, it was retained because the remaining indicators represented theoretically important aspects of performance.

The separate CFA stage shows that the measurement model was not accepted blindly. Indicators were retained or removed based on standardized loadings, statistical significance, and theoretical relevance. This is important because the later SEM results depend on the quality of the measurement model. The overall pattern of CFA results suggests that most constructs were measured adequately after refinement, while some constructs, particularly performance, remained more difficult to fit perfectly because of the small number of retained indicators and the behavioral nature of the construct.

TABLE I. STUDY CONSTRUCTS AND INDICATORS

Construct	Dimensions or items	Role in model
Safety culture	OC, OP, FS, IS	Higher order construct
Organizational commitment	SV, SF, GB indicators	Safety culture dimension
Operational personnel	SUP and IP indicators	Safety culture dimension
Formal safety system	RS, RF, SP indicators	Safety culture dimension
Informal safety system	AC, CA, PR indicators	Safety culture dimension
Motivation	MT indicators	Outcome construct
Performance	PR indicators	Outcome construct

TABLE II. SUMMARY OF REVISED CFA FIT INDICES

Construct	Removed items	Chi square df	CFI	TLI	RMSEA
Organizational commitment	GB2, SF1	1.127	0.989	0.987	0.025
Operational personnel	SUP2, IP1	1.453	0.970	0.955	0.047
Formal safety	RS4, SP5	1.344	0.975	0.968	0.041
Informal safety	AC2, AC3, CA3, PR3	0.670	1.000	1.048	0.000
Motivation	MT3	0.476	1.000	1.024	0.000
Performance	PR1	6.882	0.955	0.865	0.169

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IV. STRUCTURAL MODEL RESULTS

After validating the measurement models, a combined structural equation model was estimated to examine the relationships among safety culture, crew motivation, and crew performance. Safety culture was modeled as a higher order construct represented by organizational commitment, operational personnel, formal safety systems, and informal safety systems. The initial combined model contained several indicators with loadings below the recommended threshold of 0.50. To improve the stability and quality of the model, SV4, SP2, RS3, and MT5 were removed. The revised structural model demonstrated acceptable fit. The chi square to degrees of freedom ratio was 1.254, which is below the recommended maximum of 3.0. The comparative fit index was 0.926 and the Tucker Lewis index was 0.922, both above the minimum acceptable cutoff of 0.90. The incremental fit index was 0.928, and the root mean square error of approximation was 0.035 with a 90 percent confidence interval from 0.028 to 0.042. These values indicate that the final model provides an adequate representation of the relationships among the constructs. The second order safety culture construct showed strong representation through its four dimensions. This indicates that organizational commitment, operational personnel, formal safety systems, and informal safety systems jointly explain the broader safety culture construct among cabin crew. However, strong measurement of safety culture did not mean that all hypothesized relationships were supported. The structural relationships showed that safety culture was linked to performance but not meaningfully linked to motivation. The hypothesis results showed mixed support. The relationship between safety culture and motivation was very weak and not supported. In contrast, the relationship between safety culture and performance was moderate and supported. The relationship between motivation and performance was strong and support Because the relationship between safety culture and motivation was weak, the mediating role of motivation between safety culture and performance was not supported.

TABLE III. REVISED SEM MODEL FIT INDICES

Index	Value	Interpretation
Chi square df	1.254	Very good
NFI	0.722	Weak
IFI	0.928	Acceptable
TLI	0.922	Acceptable
CFI	0.926	Acceptable
RMSEA	0.035	Excellent

TABLE IV. HYPOTHESIS TESTING SUMMARY

Hypothesis	Relationship	Result	Decision
H1	Safety culture and motivation	0.05	Rejected
H2	Safety culture and performance	0.53	Supported
H3	Motivation and performance	0.68	Supported
H4	Motivation as mediator	Not supported	Rejected

VI. DISCUSSION

The findings suggest that safety culture in the studied airline is more strongly connected to performance than to motivation. This indicates that cabin crew may follow safety practices and perform effectively because safety procedures, systems, and operational expectations are embedded in the work environment. However, those same safety practices may not automatically increase crew motivation. This distinction is important because compliance and motivation are not the same. A safety culture can be operationally effective while still failing to create deeper psychological engagement among employees.

The moderate relationship between safety culture and performance is consistent with previous research showing that safety climate and safety culture can influence safety behavior and performance outcomes [15]. The strong relationship between motivation and performance also agrees with organizational research indicating that motivated employees tend to show stronger performance and work outcomes [8], [9]. However, the weak relationship between safety culture and motivation suggests that the airline may need to strengthen participative and human centered aspects of safety management, such as empowerment, communication, recognition, and cabin crew involvement in safety improvement.

The results also show that an instrument originally developed and validated in aviation can be adapted to cabin crew, but several items required deletion during confirmatory factor analysis and structural modeling. This suggests that cabin crew safety culture may not be identical to pilot safety culture. Cabin crew operate in a passenger facing role, handle emergency preparedness, manage service and safety simultaneously, and experience safety culture through both formal procedures and informal authority structures. Therefore, future measurement tools should reflect the cabin crew context more directly.

VII. PRACTICAL IMPLICATIONS

The practical implication of the study is that airline management should not assume that a strong safety system automatically creates motivated employees. The results indicate that safety culture can support performance even when motivation is not strongly affected. Therefore, the airline should continue maintaining strong reporting channels, safety personnel involvement, and operational supervision, but it should also introduce actions that make cabin crew feel more involved in safety development.

Improving motivation may require more than procedural compliance. Cabin crew should be given opportunities to provide feedback on safety procedures, participate in safety improvement discussions, and receive recognition for proactive safety behavior. Training should also connect safety procedures to personal meaning, professional identity, and passenger protection, rather than presenting safety only as a regulatory requirement. Strong communication between management, supervisors, safety personnel, and cabin crew is necessary to turn safety culture from a formal system into a more engaging employee experience.

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VIII. LIMITATIONS

This study has several limitations. First, the data were collected using a self-reported questionnaire, which may be affected by response bias and social desirability. Second, the sample was limited to cabin crew from one airline, which limits generalization to other airlines, regions, or aviation occupations. Third, the study used a cross sectional design, so the results describe associations at one point in time and cannot prove long term causal effects. Fourth, the original measurement instrument was derived from aviation safety culture studies that were not designed only for cabin crew, which may explain why several items had to be removed during CFA and SEM refinement.

IX. CONCLUSION AND FUTURE WORK

This study assessed the impact of safety culture on cabin crew motivation and performance in a major Middle Eastern airline. The results confirmed that safety culture has a moderate relationship with cabin crew performance, and motivation has a strong relationship with performance. However, safety culture did not show a meaningful relationship with motivation, and the mediating effect of motivation was not supported.

The findings indicate that the airline has safety practices that contribute to performance, but these practices do not sufficiently translate into motivational outcomes. Management should therefore strengthen the motivational side of safety culture by increasing cabin crew participation in safety decisions, improving communication between management and crew, and providing safety training that includes behavioral and psychological components, not only technical procedures. The airline should also continue evaluating its safety culture tools to ensure that they reflect the specific role of cabin crew.

Future research should use qualitative or mixed methods to explore why safety culture did not influence motivation in this sample. Comparative studies across different airlines and regions would also help determine whether the findings are specific to this airline or reflect a wider cabin crew pattern. Longitudinal studies are recommended to examine how safety culture develops over time and how it affects long term performance outcomes. Future studies should also develop cabin crew specific safety culture instruments rather than relying only on tools originally designed for pilots or broader aviation groups.

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